

CLAIMS

1. A fire and explosion suppression system, comprising a source (5) of pressurised liquid extinguishing agent, a source (14) of a pressurised inert gas, mist producing means (13) connected to receive a flow of the liquid extinguishing agent to produce a mist therefrom, mixing means (6) for mixing the already-produced mist into a flow of the pressurised inert gas to produce a discharge in the form of a two-phase mixture comprising a suspension of droplets of the mist in the pressurised inert gas, and characterised by control means (10) for controlling the ratio of the mass flow rate of the liquid extinguishing agent to the mass flow rate of the pressurised gas towards such a value as to tend to produce a desired droplet size distribution in and for substantially the duration of the discharge.
2. A system according to claim 1, in which the control means (10) controls the value of the ratio towards a constant value.
3. A system according to claim 1 or 2, in which the control means (10) includes means for pressurising the liquid extinguishing agent in dependence on the pressure of the inert gas.
4. A system according to claim 3, in which the pressurised inert gas is pressurised by being stored under pressure which thus reduces during the flow thereof and reduces the

mass flow rate of the inert gas, and in which the control means (10) includes means for applying the pressure of the stored inert gas to pressurise the liquid extinguishing agent whereby the reducing applied pressure correspondingly reduces the mass flow rate of the liquid extinguishing agent.

5. A system according to any preceding claim, in which the control means (10) includes controllable valve means (7) for controlling the mass flow rate of the liquid extinguishing agent during the discharge.

6. A system according to claim 5, in which the valve means (7) comprises a controllable metering valve means and the control means (10) includes means (9) for adjusting the metering valve means in dependence on the mass flow rate of the gas.

7. A system according to claim 5, in which the valve means (7) comprises a controllable metering valve means and the control means (10) includes means (18,30) for adjusting the metering valve means in dependence on the pressure of the stored inert gas.

8. A system according to claim 5, in which the controllable valve means comprises a plurality of parallel flow paths (12A,12B) for feeding the liquid extinguishing agent to the mist producing means (13) and having respective flow orifices (32,34) of different cross-sectional area, in combination with selection means (29) for selecting any one or more of the flow paths.

9. A system according to any one of claims 1 to 3, in which the control means (10) includes means for controlling the pressure of the pressurised liquid extinguishing agent.
10. A system according to claim 9, in which the control means (10) includes a pump for pressurising the source of the liquid extinguishing agent.
11. A system according to claim 10, in which the control means (10) includes means responsive to the mass flow rate of the inert gas for adjusting the pump to vary the pressure of the source of the liquid extinguishing agent.
12. A system according to any preceding claim, including means for initiating the flow of the liquid extinguishing agent before initiating the flow of the inert gas.
13. A system according to any preceding claim, in which the liquid extinguishing agent is water.
14. A system according to any one of claims 1 to 12, in which the liquid extinguishing agent is a chemical substance.
15. A fire and explosion suppression method, in which a mist of a liquid extinguishing agent is produced from a flow of the liquid extinguishing agent and is mixed into a flow

of pressurised inert gas to produce a discharge in the form of a two-phase mixture comprising a suspension of droplets of the mist in the pressurised inert gas, characterised by including the step of controlling the ratio of the mass flow rate of the liquid extinguishing agent to the mass flow rate of the pressurised gas towards such a value as to tend to produce a desired droplet size distribution in and for substantially the duration of the discharge.

16. A method according to claim 15, in which the value of the ratio is controlled towards a constant value.

17. A method according to claim 15 or 16, in which the controlling step includes the step of pressurising the liquid extinguishing agent in dependence on the pressure of the inert gas.

18. A method according to claim 17, in which the pressurised inert gas is pressurised by being stored under pressure which thus reduces during the flow thereof and reduces the mass flow rate of the inert gas, and in which the controlling step includes the step of applying the pressure of the stored inert gas to pressurise the liquid extinguishing agent whereby the reducing applied pressure correspondingly reduces the mass flow rate of the liquid extinguishing agent.

19. A method according to any one of claims 15 to 18, in which the controlling step

includes the step of controlling the mass flow rate of the liquid extinguishing agent during the discharge.

20. A method according to claim 19, in which the mass flow rate of the liquid extinguishing agent is adjusted in dependence on the mass flow rate of the gas.

21. A system according to claim 19, in which the mass flow rate of the liquid extinguishing agent is adjusted in dependence on the pressure of the stored inert gas.

22. A method according to any one of claims 15 to 17 in which the controlling step includes the step of controlling the pressure of the pressurised liquid extinguishing agent.

23. A method according to claim 22, in which the controlling step includes the step of varying the pressure of the liquid extinguishing agent in response to the mass flow rate of the inert gas.

24. A method according to any one of claims 15 to 23, including the step of initiating the flow of the liquid extinguishing agent before initiating the flow of the inert gas.

25. A method according to any one of claims 15 to 24, in which the liquid extinguishing agent is water.

26. A method according to any one of claims 15 to 24, in which the liquid extinguishing agent is a chemical substance.